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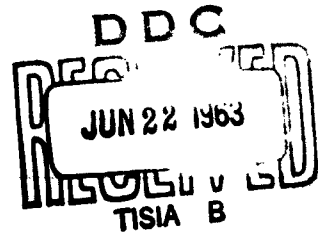
QRC-139A AEROSPACE GROUND EQUIPMENT (AGE)

Contract AF33(604)39443

LMED Requisition 32636

Period Covered: 10 May to 13 June 1963

Date of Report: 17 June 1963



Prepared for

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407 381

TABLE OF CONTENTS

Section	Title	Page
I	INTRODUCTION	1
	A. Program Description	1
	B. Equipment Description	1
II	BROADBAND SPECTRUM ANALYZER AND FREQUENCY-MEASURING CONVERTERS (S-AND L-BAND), PROGRAM STATUS	3
	A. Introduction	3
	B. Qualification Testing of the Analyzer and Converters	3
	1. S-Band Converter Humidity Test	3
III	PROGRAM FOR NEXT INTERVAL	5

SECTION I

INTRODUCTION

A. PROGRAM DESCRIPTION.

This report describes the work accomplished from 10 May to 13 June 1963 on the First Article (qualification) testing of a Broadband Spectrum Analyzer (G-E Drawing No. 7633109G1), Converter-Measuring, Frequency "S" (G-E Drawing No. 7633120G1), and Converter-Measuring, Frequency "L" (G-E Drawing No. 7633119G1).

Work on these equipments and modification kits (G-E Drawing No. 7520905G1 and 7520906G1) was performed in accordance with letter contract AF33(604)39443, LMED Requisition 32636.

B. EQUIPMENT DESCRIPTION.

The spectrum analyzer contains ten wired boards and ten subchassis assemblies and is packaged in a combination case 19 inches wide, 19 inches high, and 27 inches deep. All wired boards slide into frames in various positions around a five-inch cathode ray tube. Cooling of the analyzer is accomplished by two fans, one of which has access to outside air. Primary power input is 115 volts a-c $\pm 5\%$, 380 to 420 cps, single phase. The weight of the unit in transit condition, less the converter, is 111 pounds.

Converter-Measuring, Frequency "S" and Converter-Measuring, Frequency "L" have separate transit cases and plug into the analyzer to provide specific r-f band coverage. All a-c and d-c power for the converters is

provided by the analyzer. The weight of the converter in the transit case is 29 pounds.

The modification kit (G-E Drawing No. 7520905G1) for the Servo-Noise Amplifier Test Set (G-E Drawing No. 7631547G1) contains input and output loads for the noise amplifier board, a replacement power transformer, a power relay, decals, miscellaneous wire and hardware, and installation instructions.

The modification kit (G-E Drawing No. 7520906G1) for the Noise Response Test Set (G-E Drawing No. 7732849G1) contains a dummy load for r-f inputs to the noise amplifier board, a coupling capacitor, a high power r-f load resistor, miscellaneous wire and hardware, decals, and installation instructions. Both kits were shipped in May, 1962.

SECTION II

BROADBAND SPECTRUM ANALYZER AND FREQUENCY-MEASURING CONVERTERS (S-AND L-BAND), PROGRAM STATUS

A. INTRODUCTION.

The effort during this report period was devoted to continuing the First Article testing of the equipment.

B. QUALIFICATION TESTING OF THE ANALYZER AND CONVERTERS.

1. S-Band Converter Humidity Test.

After the previously noted failures of the humidity test on the S-Band Converter, an investigation was made into possible suitable compounds for sealing the mixer. The second compound tested was a silicone varnish similar to one which is commonly used to moisture-proof electric motor coils. A preliminary humidity test on a production mixer, and also on the First Article mixer, showed that the production mixer was adequately sealed, but the First Article mixer failed to pass the humidity test. This failure was caused by the varnish seeping in between the printed circuit boards and other electrical parts; this caused a change in the dielectric constant in critical circuits and also produced some high-resistance contacts. In addition to this, it was required that the varnish be baked for 24 hours, which was considered to be an excessively long period.

The third sealant tested was a polyvinyl flouride compound which had a drying time of 20 minutes. A production mixer, and the First Article mixer, after the latter had been thoroughly cleaned, were sealed with the compound, and were then subjected to the humidity test, with an electrical test being

given both before and after the humidity run. The production specimen passed the test successfully, but the First Article mixer readings changed by 2 db. However, it was thought that more careful and thorough application of the sealant would have resulted in the mixer having passed the test.

Therefore, this mixer was thoroughly cleaned and was then again sealed with the compound. After installation on the converter and undergoing a two-day humidity test, the mixer output was still unsatisfactory. It was concluded at this time that so many disassemblings and reassemblings of this particular First Article mixer had caused unrepairable leakages between certain sections of the printed circuit boards. It was therefore decided not to use this mixer in any further humidity tests. Instead, a new production mixer was selected, thoroughly sealed with the compound, and installed in the First Article Converter, which then successfully passed all phases of the humidity test. Thus, this particular problem appears to have been solved, and this sealant compound is now being used in the manufacturing process.

SECTION III
PROGRAM FOR NEXT INTERVAL

1. Run engineering temperature evaluation tests on the analyzer and converters to determine the cause of certain often-noted failures of the equipment to maintain specification electrical parameters. It is hoped these tests will also indicate possible remedial actions.
2. S-Band Converter Temperature Test
3. L-Band Converter Temperature Test
4. Post-environmental Performance Test
5. Complete and submit the First Article test report.